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ABSTRACT OF THE DISCLOSURE

An automated material handling system is presented for a manufacturing facility divided into separate fabrication areas. The automated material handling system plans and carries out the movement of work pieces between fabrication areas and maintains a database indicating the location of each work piece within the manufacturing facility. In one embodiment, the automated material handling system accomplishes the containerless transfer of semiconductor wafers through a wall separating a first and second fabrication areas. The wafers are transported within containers (e.g., wafer boats). The material handling system includes a number of transfer tools, including air lock chambers, mass transfer systems, robotic arms, and stock areas. The material handling system also includes a control system which governs the operations of the transfer tools as well as the dispersal of containers. The air lock chambers provide isolation between fabrication areas while permitting the transfer of wafers between the fabrication areas. A mass transfer system positioned within each air lock chamber allows for containerless transfer of wafers through the air lock chamber. The stock areas provide storage areas for containers adjacent to the air lock chambers. The robotic arms are used to move containers between the stock areas and the air lock chambers. The control system includes a main processor, a remote processor associated with each fabrication area, an internal network transmission medium coupling the main processor to the remote processors, and a cell network transmission medium within each fabrication area coupling the corresponding remote processor to one or more transfer tools.

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